

REMARKS

I. Introduction

In response to the pending Office Action, Applicants have cancelled claims 18, 19 and 28, without prejudice, and amended claims 2 and 20-24. Specifically, claim 2 has been amended to include the elements of claim 28 as well as additional features of the present disclosure.

Claim 20 has been amended to recite the elements of claim 18. In addition, claims 21-24 have been amended to change the dependency set forth in the claims. No new matter has been added.

For the reasons set forth below, it is respectfully submitted that all pending claims are in condition for allowance.

II. The Rejection Of The Claims

As claim 2 has been amended to recite the elements of claim 28 (which has been cancelled) and additional features of the present disclosure, Applicants will address the pending rejection of claim 2 in this response. Claim 2 was rejected under 35 U.S.C. § 103 as being unpatentable over USP No. 4,931,315 to Mellor in view of USP No. 6,960,799 to Descure. For at least the follow reasons, it is respectfully submitted that claim 2, as amended, is not obvious in view of Mellor and Descure, taken alone or in combination with one another.

Claim 2 is directed to a solid-state imaging device. As recited by claim 2, the device includes two different filter units each including an insulation film disposed between first and second $\lambda/4$ multilayer films, and each having a different bandpass wavelength. Further, each of the $\lambda/4$ multilayer films includes two dielectric layers (i.e., a first and second dielectric layer) which have a different refractive index. In addition, each of the first dielectric layers have

substantially the same optical thickness, and each of the second dielectric layers have substantially the same optical thickness. Finally, each of the two filter units transmits light received by a different light-receiving unit.

As a result of the structure of the device recited by claim 2, in which the two filter units are NOT arranged on top of one another, and the thickness of each of the filter units is substantially equal to a wavelength of incoming light, the color filter can be quite thin. As such, even when oblique light enters the filter units, it is possible to prevent the oblique light from entering a light-receiving element other than the intended light-receiving element. This results in an improvement in the color separation function of the device.

Furthermore, since each of the $\lambda/4$ multilayer films includes two dielectric layers having different refractive indexes, and the dielectric layers of each kind have substantially the same optical thickness regardless of the filter unit, the $\lambda/4$ multilayer films can advantageously be formed in the same semiconductor process regardless of the type of filter unit.

Turning to the cited prior art references, Mellor discloses a device for allegedly improving transmission of blue light and reflectance. In accordance with Mellor, this is done by providing an interference filter comprising alternating $\lambda/4$ layers of high-refractive index materials and low-refractive index materials, with a layer different than the $\lambda/4$ layer being provided at the top and bottom of the interference filter.

Importantly, however, Mellor does not disclose or suggest a device having two filter units each of which includes an insulation film disposed between $\lambda/4$ multilayer films including two kinds of dielectric layers having different optical thicknesses. Nor does Mellor disclose or suggest that the optical thicknesses of the insulation layers of the first and second filter units are different from one another. Finally, Mellor also fails to disclose or suggest a device in which

each first dielectric layer of the filter units has substantially the same optical thickness, and each second dielectric layer of the filter units has substantially the same optical thickness.

Descure fails to cure any of the foregoing deficiencies of Mellor. More specifically, Descure discloses a complex filter in which light-receiving elements in an array are coated with a single interference filter including an insulating layer and a conductive layer (polysilicon layer). The thickness of the interference filter changes according to the color of the light to be transmitted. However, as is clear, Descure does not disclose or suggest any of the elements recited by amended claim 2 noted above. As such, the combination of Mellor and Descure fails to render claim 2 obvious.

It is further noted that the pending rejection asserts that layers 21, 24 and 25 as shown in Fig. 5 of Mellor correspond to the $\lambda/4$ multilayer films recited by claim 2. However, as recited by claim 2, each of the $\lambda/4$ multilayer films includes a first dielectric layer formed so as to be in contact with a main surface of the insulation layer, and a second dielectric layer formed so as to be in contact with a main surface of the first dielectric layer which faces away from the insulation layer. Clearly, layers 21, 24 and 25 of Mellor are wholly distinct from the $\lambda/4$ multilayer films recited by claim 2, since layers 21 and 24 of Mellor are not in contact with one another.

For all of the foregoing reasons, it is respectfully submitted that Mellor and Descure, taken alone or in combination with one another, clearly fail to disclose or suggest each of the elements recited by amended claim 2, and therefore the combination of Mellor and Descure does not render claim 2 obvious.

III. Dependent Claims

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 2 is patentable for at least the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also patentable.

IV. Summary

Having fully and completely responded to the Office Action, Applicants submit that all of the claims are now in condition for allowance, an indication of which is respectfully solicited.

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Respectfully submitted,
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